FOXBORO®

Instruction

MI 020-460
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RTT20
I/A Series® Temperature Transmitter

Operation, Configuration, and Calibration Using a HART Communicator

SIEBE®
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Introduction

General Description

The RTT20-T Temperature Transmitter with HART communications may be configured, operated, and calibrated using the HART Model 275 Communicator (Foxboro Model HT991).

The HART Communicator is used in two environments: Offline (not connected to a transmitter) and Online (connected to a transmitter). The Main menu (shown in Figure 1) is displayed when not connected to a transmitter. The Online Menu (shown in Figure 2) is displayed when connected to a transmitter.

Reference Documents

This document contains information on configuration, calibration, and operation of the RTT20-T Temperature Transmitter using a HART Communicator. Additional information about the transmitter and the communicator is contained in the following documents:

- MI 020-453: *RTT20 I/A Series Temperature Transmitter, Installation, Configuration, Operation, Calibration, and Maintenance*.
- MAN 4250: HART Communicator Product Manual
  (Booklet supplied with the communicator).

Top Level Menu Overview

Figure 1 shows the Main menu structure of the HART Communicator. Figure 2 shows the top level Online menu for the RTT20-T Transmitter.

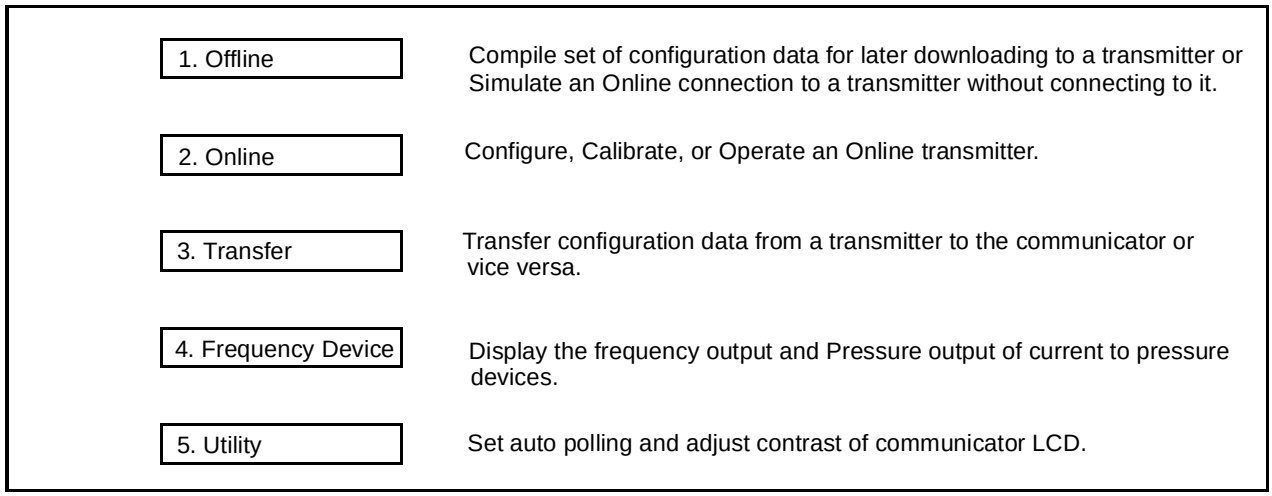
1. Offline
Compile set of configuration data for later downloading to a transmitter or Simulate an Online connection to a transmitter without connecting to it.
2. Online
Configure, Calibrate, or Operate an Online transmitter.
3. Transfer
Transfer configuration data from a transmitter to the communicator or vice versa.
4. Frequency Device
Display the frequency output and Pressure output of current to pressure devices.
5. Utility
Set auto polling and adjust contrast of communicator LCD.

Figure 1. HART Communicator Main Menu

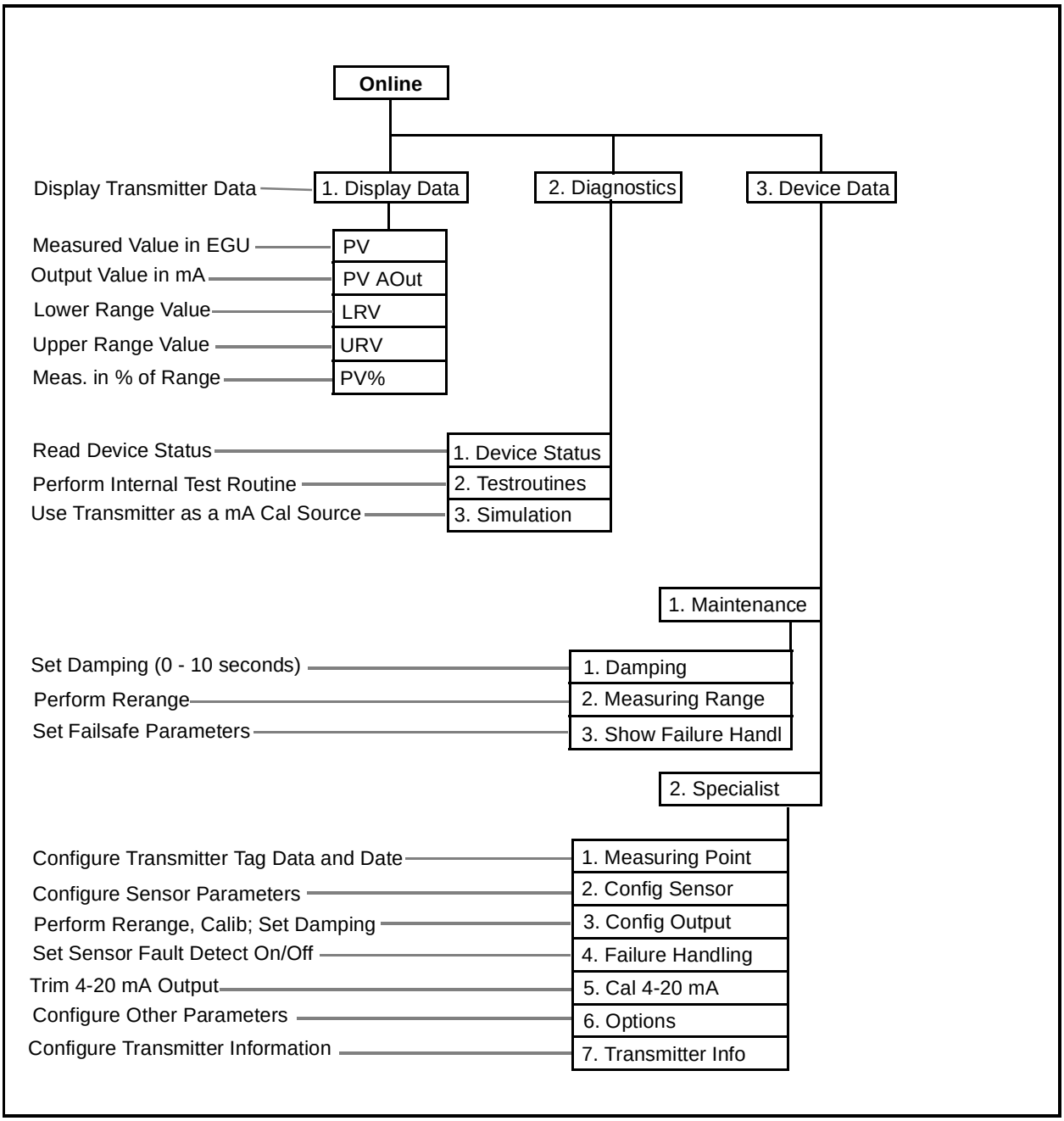

Figure 2. RTT20 Temperature Transmitter Top Level Online Menu

Connecting the Communicator to the Transmitter

Connect the communicator to the transmitter as shown in MI 020-453, supplied with the transmitter, and in MAN 4250, supplied with the communicator.

Communicator Keyboard and Display

Refer to MAN 4250 supplied with the communicator.

Operation

To display the measurement (Process Variable or PV) on the Communicator, select *2. Online* from the Main menu. Then select *1. Display Data* from the Online menu. The display will show:

PV	The measured value in engineering units.
PV AOut	The output value in mA.
LRV	The lower range value.
URV	The upper range value.
PV%	The measured value in percent of range.

Configuration

The most common practice is to configure your RTT20 Transmitter online. However, in some cases, you may wish to configure one set of data offline in your communicator and then download it to any number of RTT20 transmitters. Even though the configuration flowchart is presented in a different order for offline configuration than for online configuration, the procedure is similar to that explained below.

To configure your online transmitter with the Communicator:

1. Select *2. Online* from the Main menu.
2. Select *3. Device Data* from the Online menu.
3. Select *2. Specialist* from the next menu.
4. Follow Figure 3 and Figure 4 to access and set/change various parameters. See text in this section for an explanation of each parameter.

Online Configuration Flowcharts

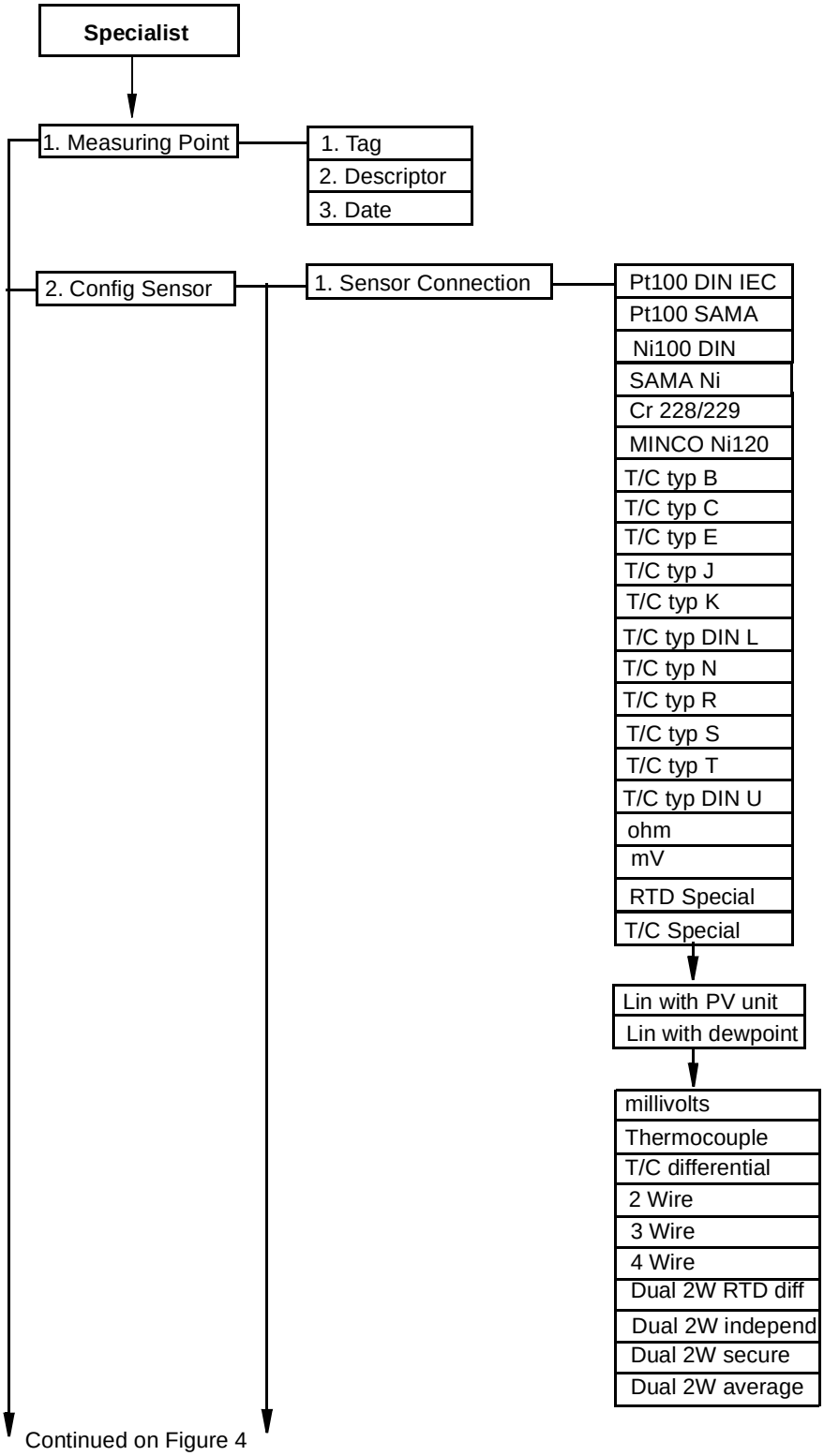

Figure 3. Online Configuration Flowchart

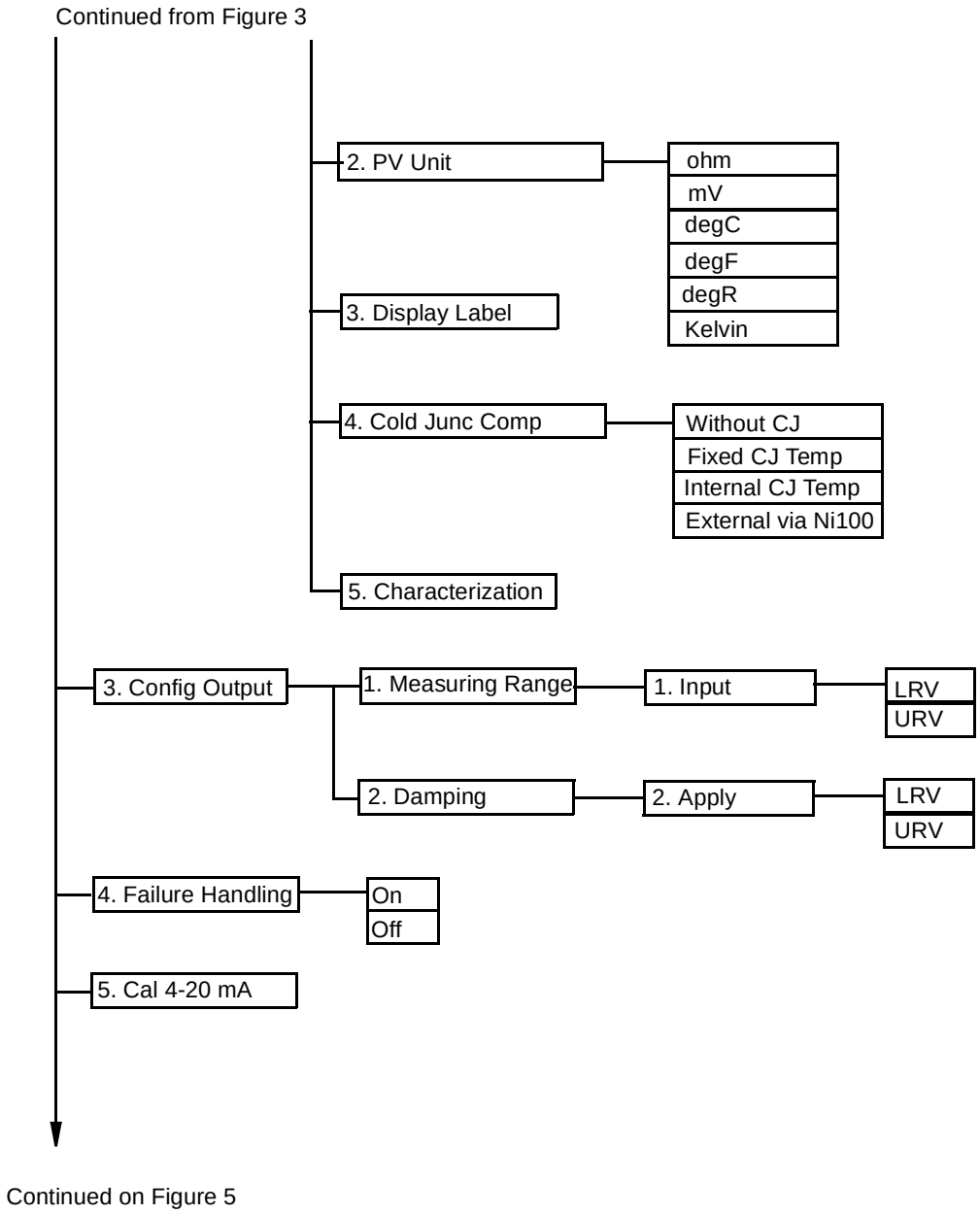

Figure 4. Online Configuration Flowchart (Continued)

Continued from Figure 4

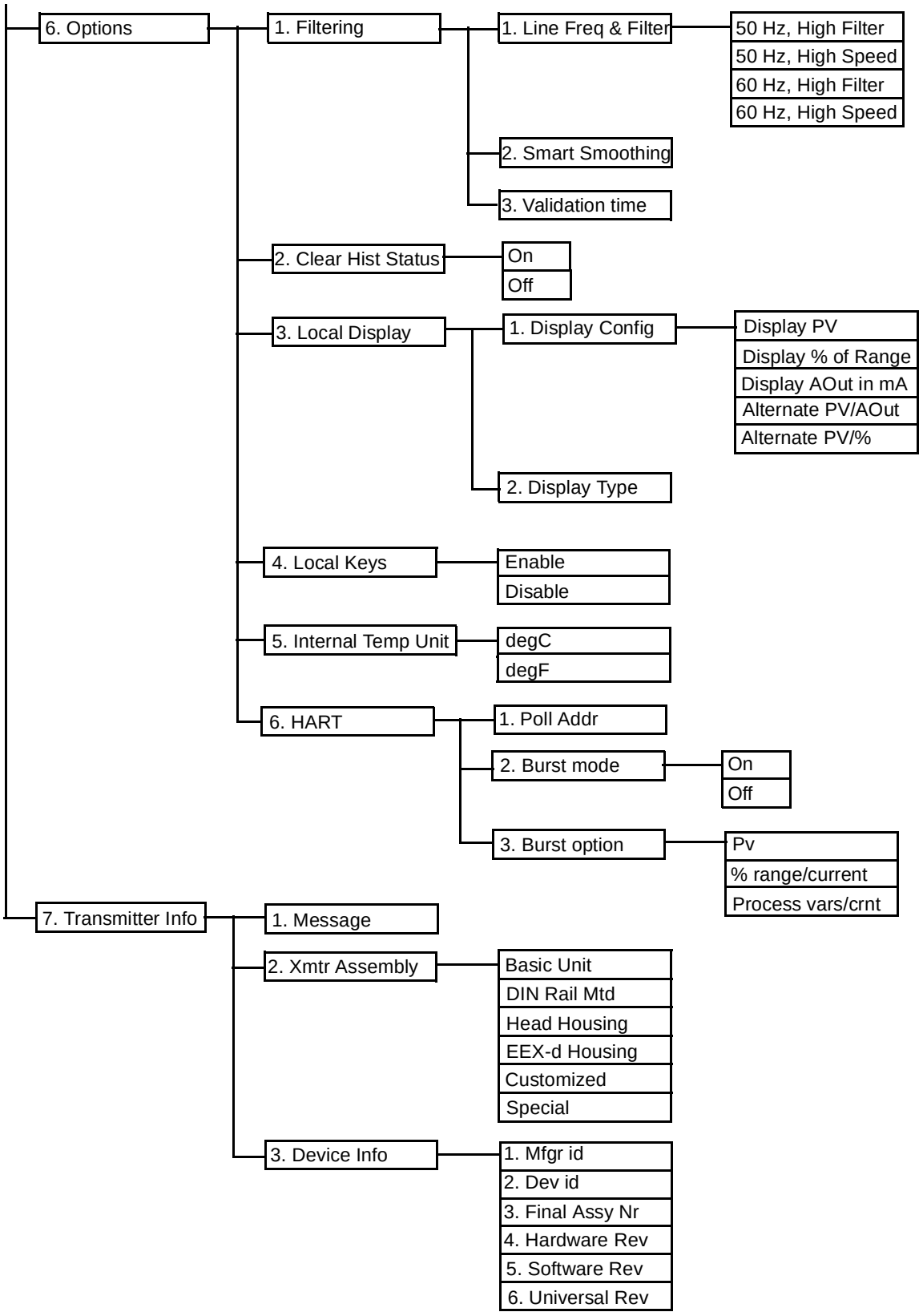

Figure 5. Online Configuration Flowchart (Continued)

Explanation of Parameters

Measuring Point

Tag	Normally configured to the plant tag number. The Tag Number is the primary identifier when communicating with a transmitter using the HART Communicator.
Description	Normally configured as the Tag Name.
Date	The date entered in the form mm/dd/yy.

Config Sensor

Sensor Conn	The input: type of thermocouple, type of RTD, mV, or ohm.
PV Unit	The process variable (ohm, mV, degC, degF, degR, Kelvin).
Display Label	The label on the third line of the optional display. Seven characters maximum.
Cold Junc Comp	Cold Junction Compensation is used with a thermocouple input only. Specify *Without CJ, Fixed CJ Temp, Internal CJ Temp,* or *External via Ni100*.
Characterization	For a calibration, specify the number of points on the curve between 2 and 22. Then specify their coordinates.

Config Output

Measuring Range	Specify *Input* to rerange the transmitter without calibration equipment or *Apply* to perform a calibration. Then specify the lower and upper range value (*LRV* and *URV*).
Damping	Damping may be specified between 0 and 30 seconds. Foxboro recommends increasing the *Smoothing* and/or *Validation time* before increasing the damping value.

Failure Handling

Specify the Sensor Fault Detection feature as *On* or *Off*.

Cal 4-20 mA

Trim the 4 and 20 mA Output by connecting a digital voltmeter and precision resistor in the output loop (see MI 020-453) and adjusting the output with this configuration parameter. This procedure should be performed only if the actual current value in the loop as measured by an accurate milliammeter does not agree with the mA value being displayed on the HART Communicator or the integral indicator (-L1 or -L3 option). This procedure should only be done after recalibrating the transmitter using accurate equipment.

Options

Filtering	*Line Freq & Filter*: Specify the ac frequency of the power supply (*50* or *60* Hz) and the ability to help eliminate noise from the power supply. Set to *High Filter* unless you require extremely fast response with damping set for 0 seconds. In that case only, set to *High Speed*. *Smart Smoothing*: Process or electrical noise is minimized by a digital filtering algorithm and is smoothed by averaging the input over an adjustable time period. Specify the time period from 0 to 30 seconds. *Validation Time*: Specify the lag time that the microprocessor holds and compares the input to past inputs. This is adjustable from 0 to 10 seconds.
Clear Historical Status	Specify *Yes* or *No*.
Local Display	*Display Config*: Specify the reading on the transmitter optional local display as Display PV, Display % of Range, Display AOut in mA, Alternate PV/AOut, and Alternate PV/%. *Display Type*: Indicates type (one line or three line) of local display (if any) that is attached to transmitter.
Local Keys	Allows you to *Enable* or *Disable* keys on the optional local indicator.
Int Temp Unit	Cold junction compensation units. Specify C or F.
HART	*Poll Addr*: Address of 0 allows the transmitter to operate in the standard point to point, two-wire 4-20 mA mode. If transmitter is to be multidrop wired, specify an address from 1 to 15. *Burst Mode*: Burst cannot be used with multidrop wiring. Therefore, specify *Off* unless the Poll Address is set to 0. *Burst Option*: Select PV, % range/current, or vars/crnt.

Calibration

The RTT20 Transmitter has an advanced self-calibration routine that greatly extends the time between recalibrations. Every three seconds, the transmitter checks the zero and full scale output against highly accurate and stable internal voltage signals that are referenced back to the factory calibration stored in nonvolatile EEPROM memory. Any adjustments are made automatically without interrupting the output signal.

Trimming 4-20 mA Output

If you have a 4-20 mA output, you may trim the output at 4 mA and 20 mA by connecting a digital voltmeter and precision resister in the output loop (see MI 020-453) and adjusting the output with the Communicator. See *Cal 4-20 mA* in previous section.

Custom Curve Calibration

Your transmitter may be calibrated to a standard or custom curve using the Communicator. See *Characterization* in previous section and follow prompts on Communicator display.

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